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10/507,215	09/16/2004	Inger-Margrethe Procida	P70074USD	5563
136 7590 12/03/2009 JACOBSON HOLMAN PLLC 400 SEVENTH STREET N.W. SUITE 600 WASHINGTON, DC 20004				
EXAMINER				
WOLLSCHLAGER, JEFFREY MICHAEL				
ART UNIT		PAPER NUMBER		
1791				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/507,215

Applicant(s)

PROCIDA, INGER-MARGRETHE

Examiner

JEFFREY WOLLSCHLAGER

Art Unit

1791

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 August 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 42-105 and 107-117 is/are pending in the application.
- 4a) Of the above claim(s) 51, 52, 54, 95-99, 108, 109 and 112-116 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 42-50, 53, 55-94, 100-105, 107, 110, 111 and 117 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-940)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

Applicant's amendment filed August 19, 2009 has been entered. Claims 51, 52, 54, 95-99, 108, 109 and 112-116 remain withdrawn from further consideration. Claims 1-41 and 106 have been canceled. Claims 42-50, 53, 55-94, 100-105, 107, 110, 111 and 117 are under examination.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 42-48, 53, 55-93, 100-105 and 117 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sjöberg et al. (US 6,106,761) in view of Hardy et al. (US 5,918,641) and either of Hirokazu et al. (US 3,513,228) or Kent (US 2,528,523).

Regarding claims 42, 46, 53, Sjöberg et al. teach the basic claimed process of producing a pipe/tube comprising extruding a mixture of polyethylene and a peroxide for crosslinking the polymer mixture (col. 4, lines 8-67) in a contact-less manner with infrared radiation (col. 1, lines 6-15; Figure 1). The process of Sjöberg et al. allows for extrusion of pipes/tubes without deformation or local thickening due to the short crosslinking zone (col. 3, lines 9-42; col. 5, line 60-col. 6, line 62). While Sjöberg et al. imply no cross-linking takes place in the extruder (i.e. extruded at a temperature below the activation/decomposition temperature of the peroxide), they do not expressly state it. However, each of Hirokazu et al. (col. 3, lines 18-50; col. 4, lines 54-61) and Kent (col. 1, lines 44-col. 2, lines 38) teach that it is known and desirable in the art of

crosslinking extruded materials to ensure the crosslinking does not happen in the extruder. Additionally, Sjöberg et al. do not teach the pipe/tube is employed in a flexible offshore pipe. However, Hardy et al. teach that it is known to employ crosslinked polyethylene as a layer in a flexible offshore pipe.

Therefore it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to have modified the teaching of Sjöberg et al. and to have ensured that no cross-linking takes place in the extruder (i.e. extruded at a temperature below the activation/decomposition temperature of the peroxide) as suggested by either of Hirokazu et al. or Kent, for the purpose, of producing a tube/pipe with a smooth surface and that flows smoothly through the cross-head/die (Hirokazu et al.: col. 3, lines 18-50; col. 4, lines 54-61 and Kent (col. 1, lines 44-col. 2, lines 38).

Additionally, it would have been obvious to one having ordinary skill at the time of the claimed invention to have employed the method of Sjöberg et al. for producing a crosslinked polyethylene tube/pipe and to have utilized it as a layer in a flexible offshore pipe as suggested by Hardy et al. for the purpose of producing a flexible pipe having a suitable structure (e.g. a crosslinked PE layer for a flexible offshore pipe) in a simple and efficient manner (e.g. Sjöberg et al.'s method of using infrared radiation that allows for a small crosslinking zone which minimizes deformation or local thickening of the tube/pipe, col. 3, lines 36-42).

As to claims 43 and 69, Kent discloses extruding at a temperature of 110 °C – 180 °C and an activation temperature of 180 °C - 250 °C (col. 2, lines 13-20).

As to claim 44, Sjöberg et al. disclose extruding onto a core/supporting unit (col. 7, lines 50-62; col. 6, lines 25-36).

As to claim 45, Sjöberg et al. disclose that an outer support is not needed by the process. Accordingly, this implies that one may be employed if desired for additional support.

(col. 6, lines 25-36). Further, the examiner notes that the instant disclosure (US 2005/0221033) acknowledges that such a calibrator is known in the art of extruding liners (paragraph [0057]).

As to claims 47, 48, 90, 91 and 117, Sjöberg et al. immediately move the extruded polymer to the infrared zone (Figure 1). It follows that minimum cooling of the tube occurs and minimum time has elapsed.

As to claims 55-58, Hardy et al. disclose the suitable densities for a crosslinked polyethylene offshore lining (col. 4, lines 28-33; col. 13, lines 38-44).

As to claims 59 and 60, Sjöberg et al. disclose the polymer is polyethylene (col. 4, lines 8-12) and employ about 0.5% peroxide in one embodiment (col. 6, lines 36-62).

As to claims 61-64, Sjöberg et al. do not expressly discuss employment of other additives or fillers. However, the claims recite "up to about" a weight percentage. This includes 0% of these materials. Further, one having ordinary skill would have readily determined what type and amount of fillers, additives or copolymers to employ in the process to achieve desired properties as is routinely practiced and well-known in the pipe/tube extrusion art.

As to claims 65-68 and 70, Sjöberg et al. disclose 0.5% di-tert-butyl peroxide (col. 6, lines 56).

As to claims 71-77, Sjöberg et al. disclose employment of infrared radiation at a wavelength of 1.2 μm . Additionally, they suggest avoiding the wavelengths of 3.2 – 3.6 μm and 6.7 - 6.9 μm , but suggest that the other wavelengths within the range of 2 - 10 μm may be employed (col. 5, lines 60- col. 6, line- 24).

As to claims 78-81, Sjöberg et al. suggest minimizing the absorption of energy into the polymer by avoiding the wavelengths of 3.2 - 3.6 μm and 6.7 - 6.9 μm . However, as shown in Figure 4, there are smaller absorption peaks at other wavelengths within the claimed ranges of 0.5 - 10 μm , 1 - 7 μm , and 3 - 7 μm that are not excluded from the teaching of Sjöberg et al.

As to claims 82 and 83, Sjoberg et al. teach that a certain overpressure in the tube is employed as is routinely practiced in the art (col. 4, lines 27-33). As to the precise pressure, one having ordinary skill would have readily determined the required pressure to ensure minimal bubble formation. Additionally, Hirokazu employ an overpressure of nitrogen to prevent foaming (col. 1, lines 62- col. 2, lines 6).

As to claims 84 and 85, Sjoberg et al. disclose the time in the crosslinking zone is short (col. 3, lines 36-44). Additionally, Hirokazu et al. disclose crosslinking times of two minutes (col. 2, lines 36-50).

As to claims 86 and 87, Kent discloses heating to a temperature of 180 °C - 250 °C (col. 2, lines 13-20) and Hirokazu et al. disclose a temperature of 200 °C – 300 °C (col. 1, lines 48-61).

As to claims 88 and 89, Sjoberg et al. disclose a desirable range of 70-90% crosslinking and exemplify 76 and 78% (col. 6, lines 55-61).

As to claim 92, the material is cooled to ambient temperature after the process (Figure 1).

As to claim 93, Sjoberg et al. disclose extruding onto a metallic core (col. 7, lines 39-62).

As to claim 100, Sjoberg et al. do not substantially change the velocity of their material during the processing (Figure 1).

As to claim 101-105, Hardy et al. exemplify a wall thickness of 10 mm (Example 2) and further suggest thicknesses greater than 12 mm (col. 8, lines 40-65). Additionally, based upon the simple and efficient method of Sjoberg et al. compared to the prior art method discussed by Hardy et al. one having ordinary skill would have readily determined and optimized the size of the thickness of the tube to a desired final thickness. One having ordinary skill would have had

a reasonable expectation of success of producing a wall of such as thickness by the method of Sjoberg et al.

Claims 49, 50, 94, 107, 110 and 111 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sjoberg et al. (US 6,106,761) in view of Hardy et al. (US 5,918,641) and either of Hirokazu et al. (US 3,513,228) or Kent (US 2,528,523), as applied to claims 42-48, 53, 55-93, and 100-105 above, and further in view of Procida et al. (WO 99/67560).

Note: Citations to Procida et al. are from the US equivalent document US 2001/0021426.

As to claims 49, 50, 94, 107, 110 and 111, the combination teaches the method set forth above. While Sjoberg et al. do teach coextruding a plurality of layers to the inside or outside of the polyethylene tube layer, as needed, with another polymer, Sjoberg et al. do not teach extruding directly onto a reinforcement layer of the offshore pipe. However, Procida et al. teach a method of extruding directly onto the carcass of an offshore pipe (Example 1). Additionally, Procida et al. teach employment of a gas permeation barrier layer to improve the barrier properties of the pipe.

Therefore it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to have extruded the layer of Sjoberg et al. onto a reinforcing layer/carcass as set forth by Procida et al. for the purpose of expediting the manufacturing process as is routinely practiced in the art. Further, it would have been obvious to one having ordinary skill at the time of the claimed invention to have employed a barrier layer in the offshore pipe as suggested by Procida et al. for the purpose of improving the barrier properties of the pipe as is routinely practiced in the art.

Claims 78-81 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sjoberg et al. (US 6,106,761) in view of Hardy et al. (US 5,918,641) and either of Hirokazu et al. (US 3,513,228) or Kent (US 2,528,523), as applied to claims 42-48, 53, 55-93, and 100-106 above, and further in view of Heino (WO 01/00381). *Note: This is an alternative rejection to the rejection of claims 78-81 above.*

Note: all citations to Heino are from the US equivalent document: US 6,797,741.

As to claims 78-81, the combination teaches the method set forth above. Additionally, Heino discloses a method of crosslinking polyethylene with infrared radiation wherein the suitable wavelength is given to be 5.0 micrometers to 1.2 micrometers (col. 4, lines 7-61) and further notes that the wavelength to be employed is readily optimized (col. 3, lines 55-60).

Therefore it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to have optimized the wavelength of infrared radiation employed to crosslink the polyethylene of Sjoberg as suggested by Heino within values of the ranges set forth in claims 79-81.

Response to Arguments

Applicant's arguments filed August 19, 2009 have been fully and carefully considered, but they are not persuasive. In general, the examiner submits the arguments are not persuasive because they either 1) focus primarily on the state of the art as presented by Hardy et al. and other cited documents without fully recognizing or addressing the fair and full teaching of Sjoberg et al. or 2) suggest limitations that are not positively required by the claims (e.g. a specific IR frequency different than that set forth by Sjoberg et al.).

Applicant argues that one having ordinary skill would not have had an expectation of success in seeking to apply the method of Sjoberg et al. because he would know that

absorption of the radiation would be necessary to generate the necessary heat. This argument is not persuasive since 1) this is not required in the independent claims and the dependent claims that do discuss IR frequency are also rejected by the combination and 2) the argument ignores the explicit teaching of Sjoberg et al. explaining why the recited IR frequencies are effective at producing a crosslinked PE tube. The examiner submits that if it is applicant's position that the IR frequency employed in the instant disclosure differentiates over Sjoberg et al. such a limitation is not presently set forth in the claims. Further, applicant argues that one having ordinary skill would expect the pipe to collapse. This argument is not persuasive. The examiner notes that Sjoberg et al. already disclose making a crosslinked PE tube (i.e. they teach a method that is understood to work to produce a crosslinked PE tube and one having ordinary skill would not have to overcome the barriers set forth by Hardy with some general teaching because Sjoberg et al. is not directed to general teaching but specific teaching). In one embodiment within the scope of claim 42 the combination merely requires taking a tube that has already been suggested by Sjoberg et al. and reinforcing it as set forth in Hardy et al. There is no reason to expect a collapse in view of the explicit teaching of Sjoberg et al.

Essentially, the examiner submits that the arguments distill down to requiring a finding that one having ordinary skill would not have had a reasonable expectation of success of producing a crosslinked PE tube having a wall thickness of 4 mm when Sjoberg et al. explicitly provide a nonlimiting example (col. 6, lines 62-66) of a crosslinked PE tube having a wall thickness of 2.5 mm (col. 6, line 42) and further disclose a provision of employing a core to produce tubes having larger dimensions (col. 7, lines 50-54). The examiner submits that applicant's arguments rely too heavily on the teaching of Hardy et al. and require one having ordinary skill to not evaluate Sjoberg et al. fully. Further, the examiner notes that applicant's arguments appear to read limitations into the claims that are not present. The examiner notes,

for example, that Sjöberg et al. is not directed to some generic teaching that states polyethylene may be crosslinked with IR radiation. The teaching of Sjöberg et al. is explicitly directed to the manufacture of crosslinked PE tubes and outlines the same concerns set forth by applicant (example: non-uniform heating; dimensional stability; local thickening due to gravitational forces; a core to make larger dimensioned tubes). As such, since Sjöberg et al. is quite detailed in their applicable teaching the examiner maintains that a *prima facie* case has been clearly established and submits that the claims would need to be further amended to overcome the fair teaching of the combination.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JEFFREY WOLLSCHLAGER whose telephone number is (571)272-8937. The examiner can normally be reached on Monday - Thursday 6:45 - 4:15, alternating Fridays.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Johnson can be reached on 571-272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jeff Wollschlager/
Primary Examiner
Art Unit 1791

December 3, 2009